Section Life Cycle Management

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International Workshop on Integrated Waste Management (Stockholm, April 2–3, 2001)

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An international workshop on system studies of integrated waste management was organised and held in Stockholm, April, 2–3, 2001. The proceedings are now available (Sundqvist et al. 2002a). This workshop can be seen as the third in a series. The previous ones, held in 1995 (Finnveden and Huppes 1995) and 1998 (Sundberg et al. 1998), focused mainly on methodological issues. This workshop concentrated on experiences from case studies.

The workshop gathered more than 40 participants consisting of a healthy mixture of young researchers and experienced scientists, such as the Professors Paul Brunner, Roland Clift and Olivier Jolliet. The proceedings document more than 20 presentations as well as 6 discussion sessions.
An overall aim of the workshop was to draw some general conclusions from the presented studies concerning

- waste strategies that generally seem to be favourable or not favourable,
- methodological approaches and assumptions that can govern the results,
- lack of knowledge.

Concerning the environmental aspects, the presented studies indicated that the waste hierarchy seems to be valid as a rule of thumb. In general, material recycling was more favorable than incineration, which, on the whole, was more favorable than landfilling (considering environmental aspects). Anaerobic digestion was difficult to compare with incineration, in some aspects being better and in some worse. Anaerobic digestion was principally better than composting, and also landfilling. A number of key aspects that can influence the results were identified:

1. Avoided products (heat, electricity, material, fertilizer). In order to have comparable systems, treatment methods producing products (such as heat or materials) typically credited for this by subtracting the environmental impacts from the avoided products. It is generally recognised that the results are very much influenced by the choice of the avoided products and their production techniques. For example, the results for incineration will change drastically if it is assumed that electricity produced from the incineration of waste replaces electricity from coal-fired power plants, or nuclear power plants or wind power. Important aspects to consider include: (1) .What is the avoided material? (2) Are there impurities in recycled and avoided material? (3) Can the recycled products reach a market?
2. Efficiency in power plants, heating plants etc. and also recycling plants.
3. Emissions and impacts from recycling plants (there seems to be a lack of data from recycling plants; these are often assumed to work ideally, while especially incineration and landfilling is modelled from field data).
4. Landfilling models, e.g. time frames.
5. Final sinks: There should be a distinction between temporary sinks (landfills) and final sinks.
6. Local conditions and local impacts are often neglected. Models should be more flexible in providing possibilities for dynamic approaches.
7. In several studies electricity is assumed to be produced by coal as a marginal electricity source. In long terms (and large changes) other electricity sources can also be of relevance, for example nuclear power or renewable sources.
8. Choice of alternatives to compare can have an influence on the conclusions drawn.
9. Stakeholders' influence: For example, stakeholders can influence the results by influencing which alternatives are studied. At the same time it is noted that the presence of stake-holders is necessary to provide scenario choices that are applicable to decision-makers.
10. Linear modeling: The models used are typically linear and non-linear aspects are therefore difficult to capture. An example where non-linear aspects can be of importance is the difference in environmental impacts from recycling when moving from low to high recycling rates.
11. Data gaps: Especially data on toxic substances where identified as an important data gap.

The points identified as key aspects also correspond to major research needs.

The report is available as a free pdf-file on www.ivl.se. Look for Reports and search for B1490. Another recent report has been published by Sundqvist et al. (2002b) producing a synthesis of several of the ongoing or recently finished Swedish systems studies on waste management. The report is only available in Swedish and can be downloaded from the same address.

References

Finnveden G, Huppes G (Eds.) (1995): Life Cycle Assessment and Treatment of Solid Waste. Proceedings of the International Workshop, September 28-29, 1995, Stockholm, Sweden. AFR-Report 98. Swedish EPA, Stockholm, Sweden

Sundberg J, Nybrandt T, Sivertun Å (Eds.) (1998): Systems Engineering Models for Waste Management. Proceedings from the international workshop held in Gothenburg Sweden 25-26 Gfebruary 1998. Part 1 and 2. AFR-Report 229. Swedish EPA, Stockholm, Sweden

Sundqvist J-O, Finnveden G, Sundberg J (Eds.) (2002a): Proceedings from Workshop on Systems Studies of Integrated Solid Waste Management in Stockholm 2-3 April 2001. IVL Report B1490, IVL, Stockholm, Sweden

Sundqvist J-O, Finnveden G, Sundberg J (Eds.) (2002b):Syntes av systemanalyser av avfallshantering. IVL Report B1491. IVL, Stockholm, Sweden